

Rejections under 35 U.S.C. § 103

Claims 1, 4, 7-10, and 12

Claims 1, 4, 7-10, and 12 stand rejected under § 103(a) as being unpatentable over U.S. Patent No. 5,619,034 to Reed et al. ("Reed") in view of U.S. Patent No. 6,107,625 to Park ("Park '625"). As the PTO recognizes in MPEP § 2143, "[t]o establish a prima facie case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." Furthermore, under MPEP § 2142, "[i]f the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness." It is submitted that the Office action does not factually support a prima facie case of obviousness based on these references for the following reasons.

Claim 1, as amended, recites in part means for sampling from the ion beam such that a share of the beam is detected on each of two detectors such that the time of flights for any or all ions of a given m/z to each of the two detectors is used for the purpose of improving the accuracy of measurement of the m/z values of ions, wherein one of the two detectors is positioned so as to intercept at least a first portion of the ionised particles and to permit a second portion of the ionised particles to continue past the detector.

The combination of Reed and Park '625 fails to teach or suggest all of the elements of amended claim 1 as required by MPEP § 2143. For example, Applicant can find no teaching or suggestion in either Reed or Park regarding a detector that is positioned so as to intercept at least a first portion of the ionised particles and to permit a second portion of the ionised particles to continue past the detector. Accordingly, claim 1 is allowable over the combination of Reed and Park '625.

Claims 4, 7-10, and 12 depend from and further limit claim 1 and are also allowable.

In addition, claim 12 recites, in part, trapping means for temporarily trapping particles released from the source in a zone adjacent to the sample prior to the acceleration of the particles. In contrast, Park '625 teaches that "[a] pulse of ions is produced within accelerator 102 These ions are immediately accelerated by accelerator 102 along the axis of the analyzer toward reflectron 104. At the beginning of the analysis, reflectron 104 is energized. Thus, ions reaching reflectron 104 are reflected back toward accelerator 102. Now, the ions are

reflected back and forth between accelerator 102 and reflectron 104 an indefinite number of times until the analysis is concluded by pulsing off or deenergizing reflectron 104." (Park '625, col. 12, lines 23-33). Accordingly, in contrast to Applicant's claim 12, Park '625 discloses reflecting particles that have already been accelerated. Therefore, claim 12 is also allowable over the cited references for this reason.

Claims 2, 3, 5, 6, 9-11, and 13

Claims 2, 3, 5, 6, 9-11, and 13 stand rejected under § 103(a) as being unpatentable over various combinations of Reed, Park '625, U.S. Patent No. 5,753,909 to Park et al. ("Park '909"), U.S. Patent No. 5,464,985 to Cornish et al. ("Cornish"), U.S. Patent No. 5,331,158 to Dowell ("Dowell"), and Applicant's admitted prior art. Claims 2, 3, 5, 6, 9-11, and 13 depend from and limit claim 1 and are allowable for at least that reason.

Claims 14 and 16

Claim 14 stands rejected under § 103(a) as being unpatentable over Reed in view of Park '625 and Dowell. As the PTO recognizes in MPEP § 2143, "[t]o establish a prima facie case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." Furthermore, under MPEP § 2142, "[i]f the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness." It is submitted that the Office action does not factually support a prima facie case of obviousness based on these references for the following reasons.

Claim 14, as amended, recites in part measuring the times of arrival of the particles at two points, one on each respective path, at differing distances from said sample, wherein the measuring includes intercepting at least a first portion of the particles on one path at a focal point and permitting a second portion of the particles to continue past the focal point. The combination of Reed, Park '625, and Dowell fails to teach or suggest all of the elements of amended claim 14 as required by MPEP § 2143. For example, Applicant can find no teaching or suggestion in the cited references regarding intercepting at least a first portion of the particles on one path at a focal point and permitting a second portion of the particles to continue past the

focal point. Accordingly, claim 14 is allowable over the combination of Reed, Park '625, and Dowell.

Claim 16 stands rejected over the combination of Reed, Park '625, and Dowell in view of Park '909. Claim 16 depends from and further limits claim 14 and is also allowable.

New claims 17-25

Independent claim 17 recites, in part, a time of flight mass spectrometer comprising a second detector positioned so as to intercept at least a first portion of reflected ionized particles and to permit a second portion of the reflected ionized particles to pass. Independent claim 23 recites, in part, detecting at least some ionized particles with first and second detectors, wherein the detecting includes intercepting at least a first portion of reflected ionized particles with the second detector and permitting a second portion of the reflected ionized particles to continue past the second detector. None of the cited references, either alone or in combination, teach or suggest all of the claim limitation of claims 17 and 23 as required by MPEP § 2143.

Accordingly, claims 17 and 23 are allowable over the cited references. Claims 18-22, 24, and 25 depend from and further limit their respective independent claims and are also allowable.

Conclusion

It is respectfully submitted that independent claims 1, 14, 15, 17, and 23 are in condition for allowance. Dependent claims 2-13, 16, 18-22, 24, and 25 depend from and further limit their respective independent claims. Applicant respectfully submits that these claims are allowable as well. Notice of allowance of all pending claims is hereby requested.

Should the Examiner deem that any further amendment is needed to place this application in condition for allowance, the Examiner is invited to telephone the undersigned at the below listed telephone number.

Respectfully submitted,

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on	<u>1-09-2003</u>
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Marked-up Claims pursuant to 37 CFR § 1.121

1. (Amended) A time of flight mass spectrometer for measuring the m/z of ionised particles, the spectrometer comprising: an ion source for generation of said ionised particles, acceleration means for acceleration of said ionised particles so as to form an ion beam, means for sampling from the ion beam such that a share of the beam is detected on each of two detectors such that the time of flights for any or all ions of a given m/z to each of the two detectors is used for the purpose of improving the accuracy of measurement of the m/z values of ions, wherein one of the two detectors is positioned so as to intercept at least a first portion of the ionised particles and to permit a second portion of the ionised particles to continue past the detector.

3. (Amended) A spectrometer according to claim 1, wherein the spectrometer includes interfacing means for transporting, or allowing the transport of ions from [the] a sample to the acceleration means.

14. (Amended) A method of time of flight spectrometry for measuring characteristics of the m/z of ionized particles, the method comprising [the steps of]:

- [a]] releasing said ionized particles from a sample;
- [b]] accelerating said particles along two paths;
- [c]] measuring the times of arrival of the particles at two points, one on each respective path, at differing distances from said sample, wherein the measuring includes intercepting at least a first portion of the particles on one path at a focal point and permitting a second portion of the particles to continue past the focal point; and
- [d]] measuring the differences or average differences in arrival times of corresponding particles at said points to enable said m/z characteristics to be determined.

15. (Amended) A method [according to claim 13,] of time of flight spectrometry for measuring characteristics of the m/z of ionized particles, the method comprising:
releasing said ionized particles from a sample;

accelerating said particles along two paths, in which both of said paths are contained in a single particle beam, with one path running alongside, but stopping short of, the other[.];

measuring the times of arrival of the particles at two points, one on each respective path, at differing distances from said sample; and

measuring the differences or average differences in arrival times of corresponding particles at said points to enable said m/z characteristics to be determined.